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(54) **Bread product and method for producing same**

(57) Bread products are made by a method comprising kneading a dough based on flour, water and yeast and then shaping into dough pieces, which are subjected to baking after fermentation, wherein said dough pieces are subjected to a partial baking which is stopped after structuration but before colouration, after which the partially baked dough pieces are placed under an at least partial vacuum, degassed, and packed and then whilst they are in their packings heat treated to sterilise the product.

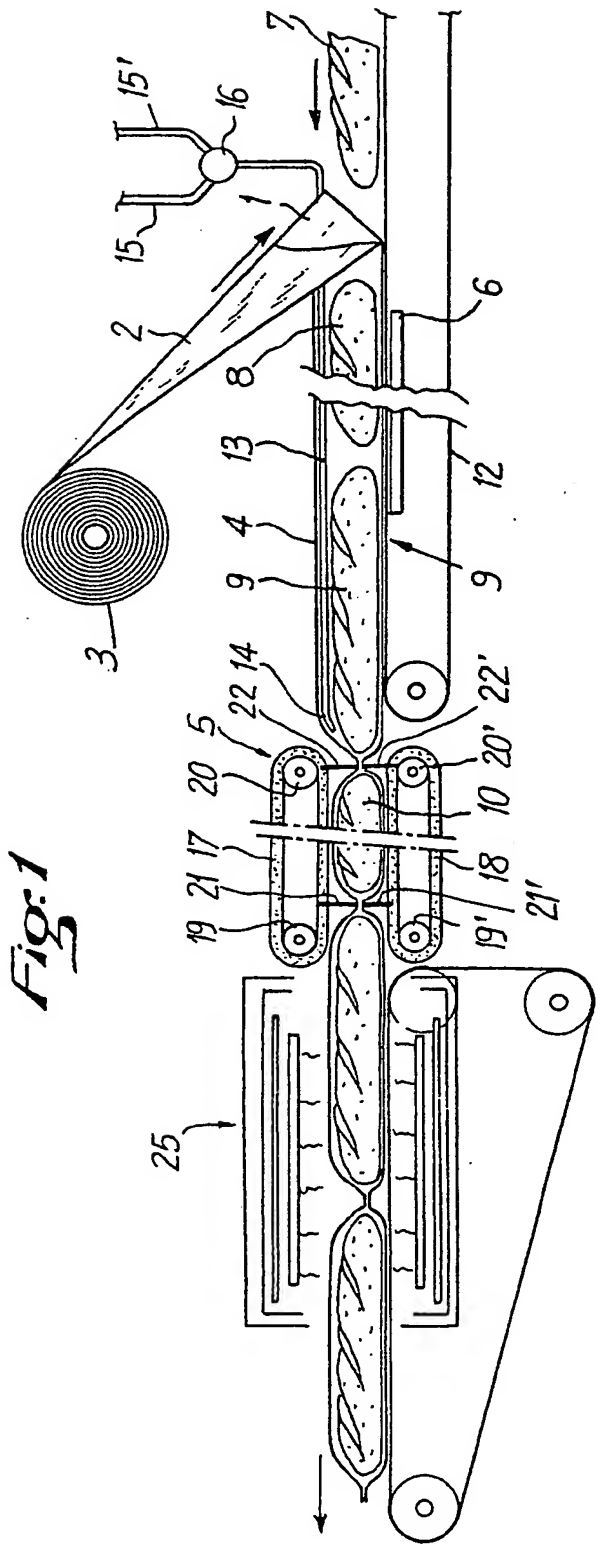
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Fig. 1

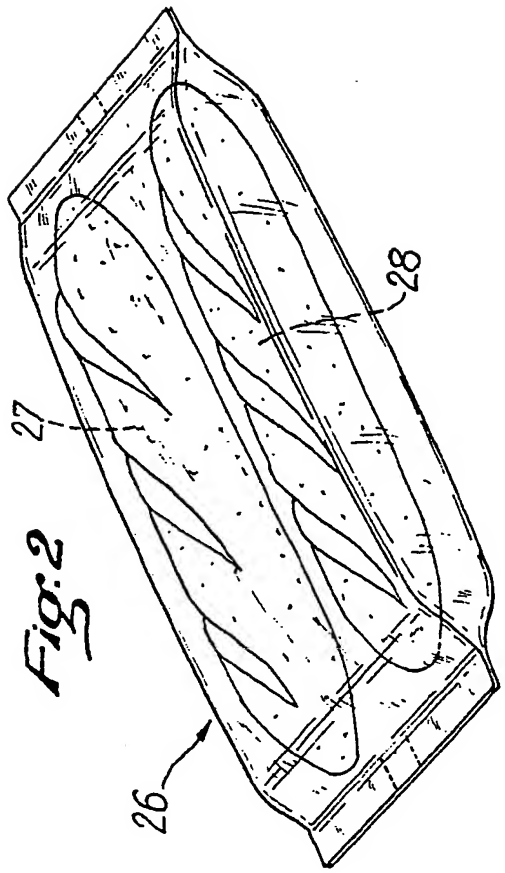
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Fig. 2

SPECIFICATION

Bread product and method for producing same

The present invention relates to a bread product and to a method for producing same.

Bread products, and particularly so-called "French" bread, are known to tend to get stale rapidly. If, therefore, too much bread is bought, it must either be consumed stale or be thrown away. It may possibly be reheated in the oven before being eaten, but then it dries up, is overcooked and it is hardly appetizing. Consequently, there is a tendancy to buy only the quantity of bread which will be consumed in the day, in order to avoid waste, and one may fined oneself short if the estimated consumption is less than the actual quantity consumed. This type of situation is often encountered by restaurant owners who never know precisely how much their clientele will consume and who, consequently, buy too much or too little bread.

It is an object of the present invention to remedy this situation and to create a bread product which keeps well, therefore which may be brought in advance for future use and to which, by a simple operation effected at the time of consumption or some time before, the appearance, consistence and flavour of a fresh bread product may be given. It will be readily appreciated that this bread product according to the invention may either replace fresh bread, or serve as complement therefor. It is thus possible to buy the minimum of fresh bread, corresponding to the estimated minimum consumption in order to avoid waste, since, if the actual consumption is higher, the bread product according to the invention may be rapidly prepared.

To this end, according to the invention, the method for making a long-life bread product to which the appearance, consistence and flavour of a fresh bread product may be simply and rapidly given, according to which method a dough based flour, water and yeast is kneaded and shaped into dough pieces which are subjected to baking after fermentation, is noteworthy in that said dough pieces are subjected to a partial baking which is stopped after structuration, but before colouration, after which the dough pieces thus partially baked are placed under at least partial vacuum, degassed and packed, then subjected, whilst they are in their packings, to a heat treatment adapted to ensure their sterilisation. Baking may advantageously be stopped when the temperature of the heart of the dough pieces is at least equal about to 70°C and at the most equal to about 100°C.

Partially cooked dough pieces are thus obtained which, in their packings, may be kept for several months. These partially baked dough pieces have a thin, only slightly coloured crust. Such dough pieces could not normally be kept and would go mouldy in less than 48 hours. Due to the fact that, according to the invention, they are packed under an at least partial vacuum and they are subjected to the above-mentioned heat treatment, the partially baked dough pieces may keep for a long time in their packings. To increase further the long life of the pre-cooked dough pieces, a neutral gas atmosphere advantageously prevails in the packings.

To obtain a fresh bread product, the partially baked dough pieces are removed from their packings, after having possibly been kept for up to several months therein, and they are subjected to further baking.

It is advantageous if the duration of partial baking of the dough pieces is approximately equal to half the total continuous baking time which would normally be necessary to obtain the bread product, and if the duration of complementary baking of the dough pieces is approximately equal to half the said total continuous baking time.

The complementary baking may be effected at a temperature of the order of 250°C.

The invention will be more readily understood on reading the following description with reference to the accompanying drawings, in which:

Figure 1 shows a view in side elevation of a packing and heat treatment chain for carrying out the method according to the invention.

Figure 2 shows a perspective view of the finished, packed product.

To carry out the method according to the invention, one starts by preparing and working the dough in conventional manner, and by forming rolls or sticks, for example.

These rolls or sticks are then partially baked, until after structuration, but before colouration. In the case of rolls intended for producing "French" bread, baking is stopped when the temperature of their heart reaches about 70°C. According to the known method of producing such bread, the continuous baking time is generally of the order of 18 to 20 minutes, at a temperature of the order of 250°C to 300°C. According to the invention, under the same baking conditions, the continuous baking time is of the order of 10 to 12 minutes.

The partially baked rolls, with pale, almost white colouring, are then packed as described hereinbelow and they may thus be kept for several months.

The device shown in Fig. 1 and intended for packing said partially baked rolls, comprises, in manner known per se, a shaping device 1 on which is guided a continuous film 2 of a heat-weldable synthetic material delivered from reel 3; this film, after passage on the shaping device 1, forms a tubular sheath 4 which is continuously conveyed from the shaping device 1 to the sealing device 5. The

edges of the sheath which join after passage on the shaping device 1 are welded by passage on a median and lower welding rail 6, of known type. The space inside the sheath, between the shaping device 1 and the welding device 5, extends over a length which is sufficiently long to produce the adequate conditions of tightness enabling the rolls to be placed in vacuo at the level of the transverse closure and sealing device 5.

The rolls 7, 8, 9, 10 are conveyed at regular intervals by a conveyor belt 12 to inside the sheath 4, passing through the orifice formed by the inlet of the shaping device 1; under these conditions, the rolls 7, 8, 9, 10 move in synchronism with the sheath from the shaping device to the transverse sealing device 5.

In the inner space of the sheath there is provided a small pipe 13 terminating at its end by a preferably widened and flattened nosepiece 14, located inside the sheath, in the zone immediately preceding the transverse sealing device 5.

The small pipe 13 leaves the inner space of the sheath, passing through the orifice of the shaping device 1 and it terminates at a three-way valve 16 connected on the one hand to a pipe 15 leading to a source of vacuum and on the other hand to a second pipe 15′ leading to a source of neutral gas such as nitrogen and CO_2.

The transverse sealing device 5 is composed of two upper and lower conveyor belts 17 and 18 respectively, maintained and driven by the rollers 19, 19′, 20, 20′, the conveyors being constituted by a belt coated with a non-stick material forming a shock-absorbing cushion, for example a foam made of synthetic material; each of the upper and lower conveyors 17 and 18 comprises transverse heat-welding bars 21, 22 and 21′, 22′. These bars are disposed transversely and are symmetrical from one conveyor to the other so that they come into register, as may be seen in Fig. 1, and imprison therebetween the transverse section of the sheath 4; these bars consequently ensure the contact and heating, with a view to its heat-welding, of the wall of the sheath and two bars forming heat-welding jaws accompany the sheath during the time corresponding to half-run, i.e. to a forward run of the conveyor, the return of the bars from their downstream position to their upstream position being ensured by the outside part of the conveyor.

Under these conditions, the bars return at regular intervals into register at the inlet of the sealing device and they approach one another until they imprison the transverse section of the wall of the sheath, ensuring closure of said latter at regular intervals and thus shaping individual bags containing one or more rolls.

The small pipe 13 is alternately placed in communication, due to the manoeuvring of the three-way valve 16, with the source of vacuum pipe 15 and with the source of gas 15′ such as nitrogen; the manoeuvring of the three-way valve is automatic and is controlled by a servo-controlled relay of electric, pneumatic or other type, so that the manoeuvre of the three way valve occurs at regular periods corresponding to the movements of the transverse heat-welding bars constituting the device closing the bags.

Thus, during the greater part of a cycle corresponding to the formation of a bag, the pipe 13 is placed in communication via the three-way valve with the source of vacuum; under these conditions, the zone of the sheath located immediately upstream of the sealing device, i.e. the zone located beneath the widened nose-piece 14, is placed under partial vacuum.

In fact, the rolls which are waiting in the space inside the sheath from the sealing device 5 to the shaping device 1, substantially fill the transverse section of the sheath and thus constitute sufficient sealing buffers or screens opposing the immediate arrival of outer air which may compenate the evacuation; thus, a sufficient partial vacuum for packing needs is obtained in the space inside the sheath immediately in front of the closure zone; in this phase of the cycle, the nosepiece 14 sucks a large part of the air inside the sheath, thus degassing the porous matter constituted by the rolls contained therein and eliminating a large part of the atmospheric oxygen present in the cells of said rolls.

In the subsequent phase which corresponds to the end of the bag-forming cycle, the jaws formed by the heat-welding bars 22, 22′ are then ready to tighten on the walls of the sheath, closing on themselves and consequently closing the bag being formed; at this stage, the three-way valve 16 places the inner pipe 13 in communication, for a limited period of time, with the source of nitrogen 15′ and nitrogen is injected in the sheath in a zone corresponding to the bag which will be closed; under these conditions, when the jaws or heat-welding bars 22, 22′ join each other, closing the bag and imprisoning the roll, the space inside the bag has had a large amount of atomospheric oxygen removed therefrom and has received in partial compensation an injection of neutral gas such as nitrogen, which will avoid any phenomenon of oxidation of the product whilst it is being kept.

Subsequently, as is seen in Fig. 1, the individual bags which constitute a continuous chain are conveyed towards a tunnel oven 25, of the infrared radiation or micro-wave type, or a combination of the two, to ensure the final heat treatment for sterilisation purposes; the packed rolls, leaving the oven, are thus sterilised and enclosed in an airtight packing containing little or no oxygen and they are

therefore ready for a long conservation, a high quality taste being maintained and any deterioration of the rolls by germ action being avoided, as the rolls are in fact protected from germs by the sealed and airtight packing.

Fig. 2 shows an individual packing 26 having left the oven and containing two rolls 27 and 28 side by side in a sealed film. This presumes that the rolls advance in twos on the conveyor 12.

When is desired to consume the rolls 27 and 28, possibly having kept them several weeks or months in the packing 26, said rolls are removed from their packing 26, placed in a conventional domestic oven and heated to about 250°C for a duration of about 10 minutes. The crust of said rolls takes its usual colour, baking is terminated and the bread obtained when the rolls are removed from the oven has the same appearance as the fresh crusty bread bought at the baker's.

CLAIMS

1. A method for obtaining a bread product, according to which a dough based on flour, water and yeast is kneaded and shaped into dough pieces, which are subjected to baking after fermentation, wherein said dough pieces are subjected to a partial baking stopped after structuration but before colouration, after which the partially baked dough pieces are placed under an at least partial vacuum, degassed and packed, then subjected, whilst they are in their packings, to a heat treatment adapted to ensure sterilisation thereof.

2. A method as claimed in Claim 1, wherein the baking is stopped when the temperature at the heart of the dough pieces is between about 70°C and 100°C.

3. A method as claimed in Claim 1, wherein, to obtain a fresh bread product, the partially baked dough pieces are removed from their packings, after having possibly been kept therein for several months, then are subjected to complementary baking.

4. A method as claimed in Claim 1, wherein the duration of partial baking of the dough pieces is approximately equal to half the total continuous baking time which would normally be necessary for obtaining the finished bread product.

5. A method as claimed in Claim 3, wherein the duration of the complementary baking of the dough pieces is approximately equal to half the total continuous baking time which would normally be necessary to obtain the finished bread product.

6. A method as claimed in one of Claims 3 or 5, wherein the complementary baking is effected at a temperature of the order of 250°C.

7. A method as claimed in Claim 1 in which a sheath is formed on a shaping device from a film, the two longitudinal edges of which are heat-welded, said tubular sheath being displaced from the shaping device towards transverse sealing members intended to form the bags each containing at least one partially baked dough piece, these dough pieces being successively introduced into said sheath at the shaping device and moving in the sheath in synchronism therewith towards the sealing device, said method being characterised on the one hand in that an at least partial vacuum is created in the zone preceding the transverse sealing members, the product enclosed in the bag formed by the transverse sealing thus being placed in vacuo and having its water vapour removed, and on the other hand in that the hermetically closed packings with partial vacuum therein are then conveyed into a chamber provided with heating means and are subjected to a heat treatment for ensuring sterilisation of the dough pieces, the degassing and removal of water vapour to which the dough pieces were previously subjected thus limiting the internal pressure inside the sealing packings.

8. A method as claimed in Claim 7, wherein the evacuation is immediately followed by the reinjection of a neutral gas to maintain a reduced pressure within the product, this reinjection occurring immediately before the closure of the bag by the action of the transverse sealing members.

9. A method as claimed in any one of the preceding Claims, carried out to obtain so-called "French" bread, wherein the duration of partial baking of dough pieces and the duration of the complementary baking are of the order of ten minutes, at a temperature of the order of 250°C.

10. A bread product enclosed in an airtight packing in vacuo, wherein it is constituted by at least one piece having undergone a partial baking stopped after structuration but before colouration, said piece then being subjected to an at least partial vacuum, being degassed and packed in said packing, said piece enclosed in its packing having, moreover, undergone a heat treatment for sterilisation thereof.

11. A method substantially as described hereinabove and illustrated in the accompanying drawings.

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